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09/679,480	10/05/2000	Yasuo Suzuki	197484US0	7558

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ALEXANDRIA, VA 22314

EXAMINER
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NOTE, JANIS L

ART UNIT	PAPER NUMBER
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1756

SHORTENED STATUTORY PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE
3 MONTHS	04/17/2007	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 04/17/2007.

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## Office Action Summary

Application No.

09/679,480

Applicant(s)

SUZUKI ET AL.

Examiner

Janis L. Dote

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 29 January 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 54-83 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 54-83 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 3/29/07.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

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1. The examiner acknowledges the cancellation of claims 1, 5-7, 10, 11, 15-17, 20, 24-26, 29, 33-35, 38-45, 47, 48, 50, 51, and 53, and the addition of claims 54-83 filed on Jan. 29, 2007. Claims 54-83 are pending.

2. The rejections of claims 1, 5-7, 10, 11, 15-17, 20, 24-26, 29, 33-35, 38, 40, 42, 44, 47, 48, 50, and 51 under the ground of nonstatutory obviousness-type double patenting over the claims in copending Application No. 11/077,356 (Application'356) combined with the other cited references, set forth in the office action, mailed on Oct. 13, 2006, paragraphs 19-24, have been mooted by the cancellation of those claims filed on Jan. 29, 2007. Furthermore, Application'356 issued as U.S. Patent NO. 7,192,677 B2 (Suzuki'677) on Mar. 20, 2007. The subject matter claimed in Suzuki'677, alone or combined with the other cited prior art, does not recite or render obvious the subject matter recited in the instant claims. Instant claims 54, 58, 63, and 67 now require that when  $Cp_1$  and  $Cp_2$ , the residual groups of couplers, in the asymmetric bisazo formula (II) are selected from the formula (C1), " $Cp_1$  and  $Cp_2$  are not a combination of (i) a 3-methylphenyl and a 2-chloro-phenyl group" (emphasis added).

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3! Applicants are advised that should claim 59 be found allowable, claim 81 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim.

See MPEP § 706.03(k).

4. The following is a quotation of the second paragraph of 35

U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 71-78 and 82 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 71, 73, 75, and 77 are indefinite because the asymmetric bisazo pigment having the formula (VII) recited in those claims is outside the scope of the asymmetric bisazo pigment recited in instant claims 54, 58, 63, and 67, from which claims 71, 73, 75, and 77, respectively, depend. The residual

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groups of couplers in formula (VII) comprise the combination of "3-methylphenyl" and "2-chlorophenyl." Claims 54, 58, 63, and 67 recite that  $Cp_1$  and  $Cp_2$ , the residual groups of couplers, in the asymmetric bisazo formula (II) are selected from the formula (C1) "with the proviso that  $Cp_1$  and  $Cp_2$  are not a combination of . . . (ii) a 3-methylphenyl and a 2-chlorophenyl group" (emphasis added).

Claims 72, 74, 76, and 78 are indefinite because the asymmetric bisazo pigment having the formula (VIII) recited in those claims is outside the scope of the asymmetric bisazo pigment recited in instant claims 54, 58, 63, and 67, from which claims 72, 74, 76, and 78, respectively, depend. The residual groups of the couplers in formula (VIII) comprise the combination of "phenyl" and "2-chlorophenyl." Claims 54, 58, 63, and 67 recite that  $Cp_1$  and  $Cp_2$ , the residual groups of couplers, in the asymmetric bisazo formula (II) are selected from the formula (C1) "with the proviso that  $Cp_1$  and  $Cp_2$  are not a combination of (i) a phenyl group and a 2-chlorophenyl group" (emphasis added).

Claim 82 is indefinite in the phrase "[t]he electrophotographic process cartridge according to claim 58, wherein the charging device is present and is a contact charger" (emphasis added) for lack of unambiguous antecedent basis for

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the term "process cartridge" in claim 58, from which claim 82 depends. Claim 58 recites an electrophotographic image forming apparatus that comprises a charging device. It is not clear to what apparatus component in the apparatus recited in claim 58, the term "process cartridge" refers.

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 54, 55, 71, 72, and 80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent 8-029998 (JP'998), as evidenced by applicants' admission at page 31, lines 9-11, of the instant specification (applicants' admission I), combined with Japanese Patent 07-295250 (JP'250), and Schaffert, Electrophotography, p. 50 and Fig. 4a, and US 4,468,110 (Tanigawa).

See the DERWENT machine-assisted translations of JP'998 and JP'250, and the Japanese Patent Office (JPO) machine-assisted translation of JP'998 for cites.

JP'998 discloses an electrophotographic photoreceptor comprising a conductive aluminum drum, an intermediate layer, a charge generation layer, and a charge transport layer. The charge generation layer comprises 3 parts by weight of a  $\tau$ -form

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metal-free phthalocyanine pigment and 3.5 parts by weight of the asymmetric bisazo pigment (I-30) that meets the limitations of formula (II) recited in instant claim 54. DERWENT translation, Table 1-(7) at page 19, compound (I)-30; paragraphs 0035, 0036, 0042, and 0043; and example 10 in paragraph 0047; and JPO translation, paragraph 0035, lines 4-5. The weight ratio of phthalocyanine pigment to bisazo pigment is 3:3.5, which is within the range of 1:5 to 5:1 recited in instant claim 54. The intermediate layer has a layer thickness of 0.1  $\mu\text{m}$ , which meets the layer thickness range of "up to 10  $\mu\text{m}$ , excluding 0" recited in instant claim 80. See the JPO translation, paragraph 0035, lines 4-5. (Note that the DERWENT translation of paragraph 0035 is missing the text in lines 4-5 of the JPO translation.) JP'998 also discloses that the asymmetric bisazo pigment can equally be any of the asymmetric bisazo pigments shown in Tables 1-(1) to 1-(11), e.g., formulas (I)-2 to (I)-6, which meet the limitations of formulas (II), (C1), and (C2) recited in instant claim 54, or formulas (I)-24 and (I)-29, which meet the limitations of formulas (VII) and (VIII), respectively, recited in instant claims 71 and 72, respectively. Also see the DERWENT translation, paragraphs 0042 and 0043, and examples 8 and 9, paragraph 0047. According to JP'998, its photoreceptor has high

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spectral sensitivity in the visible light to the near infrared region. DERWENT translation, paragraph 0004.

JP'998 does not exemplify a photoreceptor comprising an intermediate layer comprising titanium oxide as recited in the instant claims. However, JP'998 discloses that a fine-powder pigment of a metallic oxide, such as titanium oxide, may be added to the binder resin of its intermediate layer to prevent the occurrence of moire and to reduce the residual electric potential of the photoreceptor. DERWENT translation, paragraph 0030. These are the same benefits sought by applicants. See the instant specification, page 31, lines 9-11.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of JP'998, to add the metal pigment titanium oxide to the intermediate layer in the photoreceptor disclosed by JP'998. That person would have had a reasonable expectation of successfully obtaining an electrophotographic photoreceptor that prevents the occurrence of moire and exhibits a reduction in residual electric potential.

JP'998 also does not disclose that the charge transport layer comprises a sulfur-containing compound as recited in the instant claims. However, JP'998 discloses that the charge



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transport layer can comprise an antioxidant. DERWENT translation, paragraph 0027.

JP'250 discloses sulfur-containing compounds that meet the compositional limitations of formulas (III), (S-1), (S-2), and (S-3) recited in the instant claims. JP'250 discloses that said sulfur-containing compounds can be used as antioxidants in charge transport layers of photoreceptors. DERWENT translation, paragraph 0007, compounds (I-1) to (I-4) at paragraph 0026, compounds (II-1) to (II-3) at paragraph 0028. JP'250 exemplifies a charge transport layer comprising 1.5 parts by weight of the sulfur-containing antioxidant per 100 parts by weight of the charge transport material. The amount of 1.5 parts by weight was determined from the information provided in the DERWENT translation, paragraph 0050. The amount of 1.5 parts by weight per 100 parts by weight of the charge transport material is within the range of "0.1 to 5 parts by weight . . . based on 100 parts by weight" of the charge transport material recited in instant claim 54. JP'250 discloses that said sulfur-containing compounds prevent the deterioration of the photoreceptor due to ozone in the ambient air or due to strong light irradiation. The photoreceptor is said to have improved potential stability over long periods of time. DERWENT translation, paragraphs 0003, 0006, and 0007, and

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paragraph 0054, lines 1-4. JP'250 further teaches that its sulfur-containing antioxidants provide photoreceptors with improved stability of electrification and sensitivity over long periods of time compared to known hindered phenol antioxidants. DERWENT translation, Table 1, comparative examples 3 and 4, and paragraph 0054, lines 14-18.

It would have been obvious for a person having ordinary skill in the art to use JP'250's sulfur-containing compounds that meet the compositional limitations of formulas (III), (S-1), (S-2), or (S-3) recited in the instant claims, in an amount of 1.5 parts by weight per 100 parts by weight of the charge transport material in the charge transport layer, as the antioxidant in the photoreceptor rendered obvious over the teachings of JP'998. That person would have had a reasonable expectation of successfully obtaining a photoreceptor that has improved potential stability over long periods of time and that provides stable toner images after many repeated copies.

The recitation, "the photoreceptor is suitable for a reverse developing method in an electrophotographic image forming apparatus which comprises a contact charger," in claim 54 is merely a statement of intended use that does not distinguish the photoreceptor rendered obvious over the combined teachings of the cited prior art. A recitation of the intended

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use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. It is well known in the electrophotographic arts that that the "production of positive prints from line negatives requires only a change of the xerographic developing material." See Schaffert, p. 50, section 2.6.1, lines 1 and 2. According to Schaffert, "[w]hen a xerographic plate sensitized with positive charges is exposed to a line negative, the image areas are discharged and the nonimage areas remain charged . . . because of the fringe field effect, negative charges will be induced on the surface of the xerographic plate near the edges of the image areas. Such an area is represented at E in Fig. 4a. Now, if the plate is developed with an electropositive developer, the positively charged toner will be attracted to the induced negative charges, and a photographically positive image is developed." Schaffert further teaches that in the case of xerographic plates requiring negative sensitization, an electronegative developer would be used. See Schaffert, page 50, section 2.6.1, lines 4-13, and Fig. 4a. According to Tanigawa, "in reversal development, there is used a developer charged with the same polarity as that of

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the latent image background portion of the photosensitive medium. The developer is applied to the latent image portion where the charge on the surface of the photosensitive medium has been decayed by the laser beam exposure." Tanigawa, col. 1, lines 49-55. As discussed above, the photoreceptor rendered obvious over the combined teachings of the cited prior art meets the photoreceptor limitations recited in the instant claims. Thus, on the present record, the intended use recited in instant claim 54 does not appear to result in a compositional or structural difference between the photoreceptor recited in the instant claims and the photoreceptor rendered obvious over the combined teachings of the cited prior art.

8. Claim 79 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP'998, as evidenced by applicants' admission I, combined with JP'250, Schaffert, and Tanigawa, as applied to claim 54 above, further combined with additional teachings in JP'998. See the DERWENT translations of JP'998 and JP'250, and the JPO translation of JP'998 for cites.

JP'998, as evidenced by applicants' admission I, combined with JP'250, Schaffert, and Tanigawa renders obvious an electrophotographic photoreceptor as described in paragraph 7 above, which is incorporated herein by reference.

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JP'998 does not exemplify an intermediate layer having a layer thickness of 3  $\mu$ m as recited in instant claim 79. However, as discussed in paragraph 7 above, JP'998 discloses that a fine-powder pigment of a metallic oxide, such as titanium oxide, may be added to the binder resin of its intermediate layer to prevent the occurrence of moire and to reduce the residual electric potential of the photoreceptor. DERWENT translation, paragraph 0030. These are the same benefits sought by applicants. See the instant specification, page 31, lines 9-11. JP'998 also teaches that the intermediate layer may have a layer thickness of "0 to 10  $\mu$ m." DERWENT translation, paragraph 0031. The range of "0 to 10  $\mu$ m" encompasses the thickness of 3  $\mu$ m recited in instant claim 79.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of JP'998, to add the metal pigment titanium oxide to the intermediate layer and to adjust, through routine experimentation, the thickness of the intermediate layer, such that the thickness is 3  $\mu$ m, as recited in instant claim 79, in the photoreceptor rendered obvious over the combined teachings of JP'998, JP'250, Schaffert, and Tanigawa. That person would have had a reasonable expectation of successfully obtaining an electrophotographic photoreceptor that prevents the occurrence of moire and exhibits a reduction

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in residual electric potential, and that has the benefits disclosed by JP'250.

9. Claims 58-60, 63, 64, 67, 68, 73-78, and 81-83 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP'998, as evidenced by applicants' admission I, combined with JP'250, Schaffert, and Tanigawa, as applied to claims 54, 55, 71, and 72 above, further combined with US 5,047,803 (Kanoto). See the DERWENT translations of JP'998 and JP'250, and the JPO translation of JP'998 for cites.

JP'998, as evidenced by applicants' admission I, combined with JP'250, Schaffert, and Tanigawa renders obvious an electrophotographic photoreceptor as described in paragraph 7 above, which is incorporated herein by reference.

JP'998 does not disclose that the electrophotographic photoreceptor can be used in a process cartridge or in an apparatus as recited in the instant claims. Nor does JP'998 disclose that its photoreceptor can be used in the imaging forming method recited in the instant claims.

However, the use of process cartridges in electrophotographic apparatuses is well known in the art.

Kanoto discloses that process cartridges in electrophotographic apparatuses are well known in the art.

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Kanoto discloses that process cartridges comprising an electrophotographic photoreceptor and at least one processing means, such as a contact roller charger or a corona charger, a developing device, a cleaner, and other elements are widely used in the field of image forming apparatuses that are small and that do not require maintenance. Col. 1, lines 18-28, and col. 3, lines 36-38. Kanoto discloses an imaging forming apparatus comprising a process cartridge that is easily dismounted from the main assembly of the image forming apparatus. Col. 1, lines 60-63. Kanoto shows an example of such an apparatus in Fig. 1. The apparatus comprises a process cartridge **100**, a laser beam scanner **7** as the image-wise exposure source, an image transfer roller **8** to transfer the toned image from the photoreceptor to a receiving member, and a pair of fixing rollers **15a** and **15b** to fix the toned image on the receiving member. The process cartridge **100** comprises a photosensitive drum **1** (i.e., photoreceptor), a charging roller **2**, a developing device **3**, and a cleaning device **4** to remove residual toner or other contaminants from the photoreceptor after development. See Fig. 1, and col. 2, line 37, to col. 4, line 38. Charging roller **2** meets the contact charger recited in instant claims 59, 81, and 82. Kanoto discloses that the charging roller **2**, the developing

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device **3**, or the cleaning device **4** need not be contained in the process cartridge **100**, but can be part of the image forming apparatus. Col. 2, lines 57-60. Kanoto further discloses that the developing device **3** in the process cartridge or image forming apparatus can reverse develop the electrostatic latent image formed on the photoreceptor with a developer having the same polarity as the charge remaining on the photoreceptor. Col. 3, lines 57-61. Said developing device meets the developing device recited in instant claims 58 and 63. Kanoto further discloses that its imaging apparatus performs an image forming process that meets the process steps recited in instant claims 67 and 83, but for the step of the providing the particular photoreceptor. Kanoto, col. 3, line 49, to col. 4, line 38.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Kanoto, to incorporate the electrophotographic photoreceptor rendered obvious over the combined teachings of JP'998, JP'250, Schaffert, and Tanigawa in Kanoto's detachable process cartridge in its image forming apparatus. That person would have had reasonable expectation of successfully obtaining a reversal development imaging method and an image forming apparatus comprising an easily detachable process cartridge having the



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benefits of being small and free from maintenance, each of which provides stable toner images after many repeated runs as disclosed by JP'250.

10. Claim 56 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP'998, as evidenced by applicants' admission I, combined with JP'250, Schaffert, and Tanigawa, as applied to claim 55 above, further combined with US 4,507,374 (Kakuta), as evidenced by applicants' admission at page 21, lines 11-19, of the instant specification (applicants' admission II), and DERWENT abstract Acc. No. 1983-816039. See the DERWENT translations of JP'998 and JP'250, and the JPO translation of JP'998 for cites.

JP'998, as evidenced by applicants' admission I, combined with JP'250, Schaffert, and Tanigawa renders obvious an electrophotographic photoreceptor as described in paragraph 7 above, which is incorporated herein by reference.

As set forth in paragraph 7, supra, JP'998 discloses that the phthalocyanine pigment is a  $\tau$ -form metal-free phthalocyanine. However, JP'998 does not disclose that the  $\tau$ -form metal-free phthalocyanine pigment has the X-ray diffraction pattern recited in the instant claim.

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Kakuta discloses a  $\tau$ -form metal-free phthalocyanine pigment having a X-ray diffraction pattern with characteristic Bragg angles ( $2\theta \pm 0.2^\circ$ ) of  $7.6^\circ$ ,  $9.2^\circ$ ,  $16.8^\circ$ ,  $17.4^\circ$ ,  $20.4^\circ$ , and  $20.9^\circ$ .

Col. 2, lines 16-19, col. 4, lines 38-42, 53-55, and Fig. 4.

Kakuta discloses that photoreceptors comprising said phthalocyanine exhibits high sensitivities to longer wavelength light. Col. 1, lines 58-63. Kakuta discloses that said phthalocyanine exhibits a maximum sensitivity at 790-810 nm, and is most useful in photoconductors image-wise exposed to a semiconductor laser. Col. 9, lines 38-41.

Kakuta does not disclose that the X-ray diffraction pattern of its  $\tau$ -form metal-free phthalocyanine exhibits Bragg angles of  $21.7^\circ$  and  $27.6^\circ$  as recited in the instant claim. However, the instant specification discloses that the  $\tau$ -form metal-free phthalocyanine having the X-ray diffraction pattern recited in the instant claim can be prepared by a method described in Japanese Patent 58-182639 (JP'639). Instant specification, page 21, lines 11-19. Kakuta is the US equivalent of JP'639. See the DERWENT abstract Acc. No. 1983-816039. Because all six Bragg angles disclosed by Kakuta correspond to Bragg angles recited in the instant claim, and because Kakuta's  $\tau$ -form metal-free phthalocyanine is obtained by a method that makes a  $\tau$ -form metal-free phthalocyanine having the X-ray diffraction pattern

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recited in the instant claim, it is reasonable to presume that Kakuta's  $\tau$ -form metal-free phthalocyanine has a X-ray diffraction pattern that meets the limitation recited in the instant claim. The burden is on applicants to prove otherwise. In re Fitzgerald, 205 USPQ 594 (CCPA 1980).

It would have been obvious for a person having ordinary skill in the art to use Kakuta's  $\tau$ -form metal-free phthalocyanine pigment as the  $\tau$ -form metal-free phthalocyanine in the photoreceptor rendered obvious over the combined teachings of JP'998, JP'250, Schaffert, and Tanigawa. That person would have had a reasonable expectation of successfully obtaining a photoreceptor having improved sensitivity to the longer wavelength region, and having the benefits disclosed by JP'998 and JP'250.

11. Claims 61, 65, and 69 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP'998, as evidenced by applicants' admission I, combined with JP'250, Schaffert, Tanigawa, and Kanoto, as applied to claims 60, 64, and 68 above, further combined with Kakuta, as evidenced by applicants' admission II and DERWENT abstract Acc. No. 1983-816039. See the DERWENT translations of JP'998 and JP'250, and the JPO translation of JP'998 for cites.

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JP'998, as evidenced by applicants' admission I, combined with JP'250, Schaffert, Tanigawa, and Kanoto renders obvious an imaging apparatus comprising a process cartridge and an image forming method as described in paragraph 9 above, which is incorporated herein by reference.

As discussed in paragraph 9 above, JP'998 discloses that the phthalocyanine pigment is a  $\tau$ -form metal-free phthalocyanine. JP'998 does not disclose that the  $\tau$ -form metal-free phthalocyanine pigment has the X-ray diffraction pattern recited in the instant claims.

Kakuta discloses a  $\tau$ -form metal-free phthalocyanine pigment that appears to have a X-ray diffraction pattern that meets the limitations recited in the instant claims. The discussions of Kakuta, applicants' admission II, and the DERWENT abstract, in paragraph 10, supra, are incorporated herein by reference.

It would have been obvious for a person having ordinary skill in the art to use Kakuta's  $\tau$ -form metal-free phthalocyanine pigment as the  $\tau$ -form metal-free phthalocyanine in the photoreceptor rendered obvious over the combined teachings of JP'998, JP'250, Schaffert, and Tanigawa and to use the resultant photoreceptor in the apparatus disclosed by Kanoto. That person would have had a reasonable expectation of successfully obtaining a photoreceptor having improved

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sensitivity to the longer wavelength region, thereby providing an electrophotographic image forming apparatus comprising an easily detachable process cartridge and a reversal development imaging method that also have improved sensitivity to the longer wavelength region, and that provide good toner images as taught by JP'250.

12. Claims 54, 55, 71, 72, and 80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent 7-128890 (JP'890), as evidenced by applicants' admission I, combined with JP'250, Schaffert, and Tanigawa. See the DERWENT machine-assisted translations of JP'890 and JP'250 for cites.

JP'890 discloses an electrophotographic photoreceptor comprising a conductive aluminum drum, an intermediate layer, a charge generation layer, and a charge transport layer. The intermediate layer has a thickness of 0.1  $\mu\text{m}$ , which meets the layer thickness of "up to 10  $\mu\text{m}$ , excluding 0" recited in instant claim 80. The charge generation layer comprises 2.5 parts by weight of an X-form metal-free phthalocyanine pigment and 3 parts by weight of the asymmetric bisazo pigment (I-30), which meets the limitations of formula (II) recited in instant claim 54. Translation, Table 1-(7) at page 20, compound (I)-30; paragraphs 0035, 0036, 0042, and 0043; and example 10 in

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paragraph 0047. (Note that the DERWENT translation paragraph 0042 incorrectly states that "3.0 weight parts and 2.5 weight-parts of X type metal-less phthalocyanines were added for the illustration compound (1)-24 disazo pigment." Paragraph 0042 in JP'890 states that 3.0 weight parts of the compound (1)-24 and 2.5 weight parts of X type metal-less phthalocyanine are used to form the charge generation layer.) The weight ratio of phthalocyanine pigment to bisazo pigment is 2.5:3, which is within the range of 1:5 to 5:1 recited in instant claim 54. JP'998 also discloses that the asymmetric bisazo pigment can equally be any of the asymmetric bisazo pigments shown in Tables 1-(1) to 1-(11), e.g., formulas (I)-2 to (I)-6, which meet the limitations of formulas (II), (C1), and (C2) recited in instant claim 54, or formulas (I)-24 and (I)-29, which meet the limitations of formulas (VII) and (VIII), respectively, recited in instant claims 71 and 72, respectively. Also see the DERWENT translation, paragraphs 0042 and 0043, and examples 8 and 9, paragraph 0047. According to JP'890, its photoreceptor has high spectral sensitivity in the visible light to the near infrared region. Translation, paragraph 0004.

JP'890 does not exemplify a photoreceptor comprising an intermediate layer comprising titanium oxide as recited in the instant claims. However, JP'890 discloses that a fine-powder

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pigment of a metallic oxide, such as titanium oxide, may be added to the binder resin of its intermediate layer to prevent the occurrence of moire and to reduce the residual electric potential of the photoreceptor. Translation, paragraph 0030. These are the same benefits sought by applicants. See the instant specification, page 31, lines 9-11.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of JP'890, to add the metal pigment titanium oxide to the intermediate layer in the photoreceptor disclosed by JP'890. That person would have had a reasonable expectation of successfully obtaining an electrophotographic photoreceptor that prevents the occurrence of moire and exhibits a reduction in residual electric potential.

JP'890 does not disclose that the charge transport layer comprises a sulfur-containing compound as recited in the instant claims.

JP'250 discloses sulfur-containing compounds that meet the compositional limitations of formulas (III), (S-1), (S-2), and (S-3) recited in the instant claims. JP'250 discloses that said sulfur-containing compounds can be used as antioxidants in charge transport layers of photoreceptors. The discussion of

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JP'250 in paragraph 7, supra, is incorporated herein by reference.

It would have been obvious for a person having ordinary skill in the art to use JP'250's sulfur-containing compounds that meet the compositional limitations of formulas (III), (S-1), (S-2), or (S-3) recited in the instant claims in an amount of 1.5 parts by weight per 100 parts by weight of the charge transport material, as an antioxidant in the charge transport layer in the photoreceptor rendered obvious over the teachings of JP'890. That person would have had a reasonable expectation of successfully obtaining a photoreceptor that has improved potential stability over long periods of time and that provides stable toner images after many repeated copies.

The recitation, "the photoreceptor is suitable for a reverse developing method in an electrophotographic image forming apparatus which comprises a contact charger," in claim 54 is merely a statement of intended use that does not distinguish the photoreceptor rendered obvious over the combined teachings of the cited prior art. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing



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the intended use, then it meets the claim. It is well known in the electrophotographic arts that that the "production of positive prints from line negatives requires only a change of the xerographic developing material." The discussions of Schaffert and Tanigawa in paragraph 7 above are incorporated herein by reference. As discussed above, the photoreceptor rendered obvious over the combined teachings of the cited prior art meets the photoreceptor limitations recited in the instant claims. Thus, on the present record, the intended use recited in instant claim 54 does not appear to result in a compositional or structural difference between the photoreceptor recited in the instant claims and the photoreceptor rendered obvious over the combined teachings of the cited prior art.

13. Claim 79 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP'890, as evidenced by applicants' admission I, combined with JP'250, Schaffert, and Tanigawa, as applied to claim 54 above, further combined with additional teachings in JP'890. See the DERWENT translations of JP'890 and JP'250 for cites.

JP'890, as evidenced by applicants' admission I, combined with JP'250, Schaffert, and Tanigawa renders obvious an

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electrophotographic photoreceptor as described in paragraph 12 above, which is incorporated herein by reference.

JP'890 does not exemplify an intermediate layer having a layer thickness of 3  $\mu\text{m}$  as recited in instant claim 79. However, as discussed in paragraph 12 above, JP'890 discloses that a fine-powder pigment of a metallic oxide, such as titanium oxide, may be added to the binder resin of its intermediate layer to prevent the occurrence of moire and to reduce the residual electric potential of the photoreceptor. Translation, paragraph 0030. These are the same benefits sought by applicants. See the instant specification, page 31, lines 9-11. JP'890 also teaches that the intermediate layer may have a layer thickness of "0 to 5  $\mu\text{m}$ ." Translation, paragraph 0031. The range of "0 to 5  $\mu\text{m}$ " encompasses the thickness of 3  $\mu\text{m}$  recited in instant claim 79.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of JP'890, to add the metal pigment titanium oxide to the intermediate layer and to adjust, through routine experimentation, the thickness of the intermediate layer, such that the thickness is 3  $\mu\text{m}$ , as recited in instant claim 79, in the photoreceptor rendered obvious over the combined teachings of JP'890, JP'250, Schaffert, and Tanigawa. That person would have had a reasonable expectation

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of successfully obtaining an electrophotographic photoreceptor that prevents the occurrence of moire and exhibits a reduction in residual electric potential, and that has the benefits disclosed by JP'250.

14. Claims 58-60, 63, 64, 67, 68, 73-78, and 81-83 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP'890, as evidenced by applicants' admission I, combined with JP'250, Schaffert, and Tanigawa, as applied to claims 54, 55, 71, and 72 above, further combined with Kanoto. See the DERWENT translations of JP'890 and JP'250 for cites.

JP'890, as evidenced by applicants' admission I, combined with JP'250, Schaffert, and Tanigawa renders obvious an electrophotographic photoreceptor as described in paragraph 12 above, which is incorporated herein by reference.

JP'890 does not disclose that the electrophotographic photoreceptor can be used in a process cartridge or in an apparatus as recited in the instant claims. Nor does JP'890 disclose that its photoreceptor can be used in the imaging forming method recited in the instant claims.

However, the use of process cartridges in electrophotographic apparatuses is well known in the art. Kanoto discloses an imaging forming apparatus comprising a

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readily detachable process cartridge. The apparatus and process cartridge meet the structural limitations recited in instant claims 58, 59, 63, 81, and 82 but for the particular photoreceptor. Kanoto further discloses that its imaging apparatus performs an image forming process that meets the process steps recited in instant claims 67 and 83, but for the step of the providing the particular photoreceptor. The discussion of Kanoto in paragraph 9, supra, is incorporated herein by reference.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Kanoto, to incorporate the electrophotographic photoreceptor rendered obvious over the combined teachings of JP'890, JP'250, Schaffert, and Tanigawa in Kanoto's detachable process cartridge in its image forming apparatus. That person would have had reasonable expectation of successfully obtaining a reversal development imaging method and an image forming apparatus comprising an easily detachable process cartridge having the benefits of being small and free from maintenance, each of which provides stable toner images after many repeated runs as disclosed by JP'250.

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15. Claim 57 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP'890, as evidenced by applicants' admission I, combined with JP'250, Schaffert, and Tanigawa, as applied to claim 55 above, further combined with US 3,357,989 (Byrne). See the DERWENT translations of JP'890 and JP'250 for cites.

JP'890, as evidenced by applicants' admission I, combined with JP'250, Schaffert, and Tanigawa renders obvious an electrophotographic photoreceptor as described in paragraph 12 above, which is incorporated herein by reference.

As set forth in paragraph 12, supra, JP'890 discloses that the phthalocyanine pigment is a X-form metal-free phthalocyanine. Translation of JP'890, examples 8 and 9. JP'890 does not disclose that the X-form metal-free phthalocyanine pigment has the X-ray diffraction pattern recited in the instant claim.

However, a X-form metal-free phthalocyanine pigment having a X-ray diffraction pattern recited in instant claim 57 is well known in the art, as shown by Byrne. Byrne discloses a X-form metal-free phthalocyanine pigment having a X-ray diffraction pattern that meets the limitations recited in the instant claim. See Fig. 1, and col. 2, lines 50-54, col. 5, lines 14-22, and reference claim 1. Byrne's phthalocyanine has photosensitivity

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to the wavelength region of greater than 700 nm. See Fig. 2.

Byrne discloses that its phthalocyanine is especially useful as a photoconductive material in electrophotography, and that it provides "surprisingly high photosensitivity." Col. 2, lines 3-9.

It would have been obvious for a person having ordinary skill in the art to use Byrne's X-form metal-free phthalocyanine pigment having a X-ray diffraction pattern that meets the limitation of the instant claim as the X-form metal-free phthalocyanine in the photoreceptor rendered obvious over the combined teachings of JP'890, JP'250, Schaffert, and Tanigawa. That person would have had a reasonable expectation of successfully obtaining a photoreceptor having improved sensitivity to the longer wavelength region and having the benefits disclosed by JP'890 and JP'250.

16. Claims 62, 66, and 70 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP'890, as evidenced by applicants' admission I, combined with JP'250, Schaffert, Tanigawa, and Kanoto, as applied to claims 60, 64, and 68 above, further combined with Byrne. See the DERWENT machine-assisted translations of JP'890 and JP'250 for cites.

JP'890, as evidenced by applicants' admission I, combined with JP'250, Schaffert, Tanigawa, and Kanoto renders obvious an imaging apparatus comprising a process cartridge and an image forming method as described in paragraph 14 above, which is incorporated herein by reference.

As discussed in paragraph 14 above, JP'890 discloses that the phthalocyanine pigment is a X-form metal-free phthalocyanine. JP'890 does not disclose that the X-form metal-free phthalocyanine pigment has the X-ray diffraction pattern recited in the instant claims. However, a X-form metal-free phthalocyanine pigment having a X-ray diffraction pattern recited in the instant claims is well-known in the art, as shown by Byrne. The discussion of Byrne in paragraph 15, supra, is incorporated herein by reference.

It would have been obvious for a person having ordinary skill in the art to use Byrne's X-form metal-free phthalocyanine pigment as the X-form metal-free phthalocyanine in the photoreceptor rendered obvious over the combined teachings of JP'890, JP'250, Schaffert, and Tanigawa and to use said photoreceptor in the apparatus disclosed by Kanoto. That person would have had a reasonable expectation of successfully obtaining a photoreceptor having improved sensitivity to the longer wavelength region, thereby providing an

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electrophotographic image forming apparatus comprising an easily detachable process cartridge and a reversal development imaging method that have improved sensitivity to the longer wavelength region and that provide good toner images as taught by JP'250.

17. Applicant's arguments filed on Jan. 29, 2007, as applicable to the rejections over JP'998 and the rejections over JP'890, set forth in paragraphs 7-16 above have been fully considered but they are not persuasive.

Applicants assert that none of the cited references discloses or suggests a compound of formula (II) in which Cp<sub>1</sub> and Cp<sub>2</sub> are selected from the formulas (C1 to (C8).

Applicants' assertion is not persuasive. For the reasons discussed in the rejections in paragraphs 7 and 12 above, JP'998 and JP'890 both teach a bisazo pigment that meets the compositional limitations of formula (II) recited in the instant claims.

Accordingly, the rejections in paragraphs 7-16 stand.

18. Applicants' amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicants are



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reminded of the extension of time policy as set forth in 37

CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janis L. Dote whose telephone number is (571) 272-1382. The examiner can normally be reached Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Mark Huff, can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry regarding papers not received regarding this communication or earlier communications should be directed to Supervisory Application Examiner Ms. Claudia Sullivan, whose telephone number is (571) 272-1052.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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JLD

Apr. 7, 2007

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